

MAGNE-HEAD

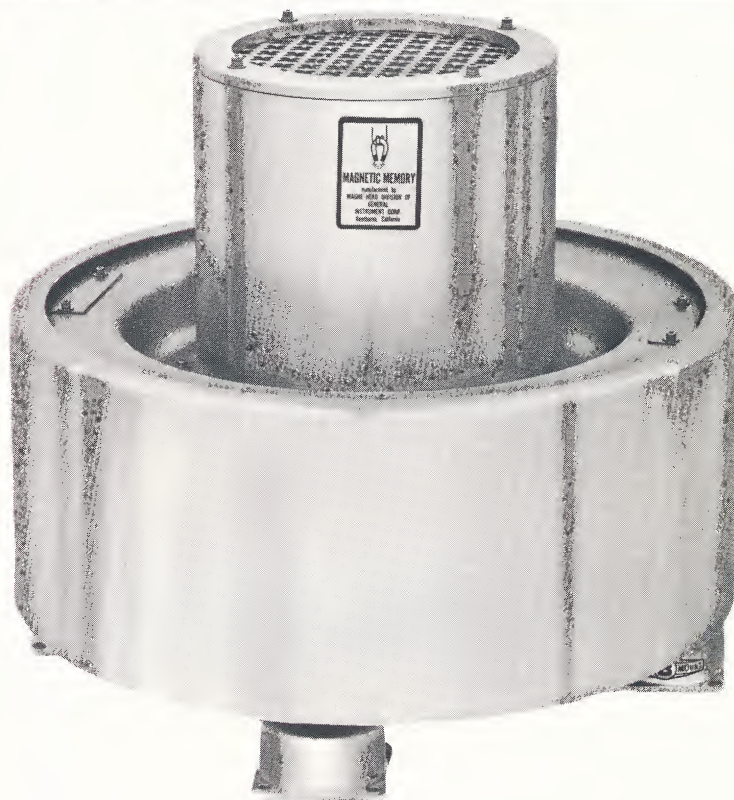
DATA BULLETIN



MODEL 71-64 MAGNETIC MEMORY DISC

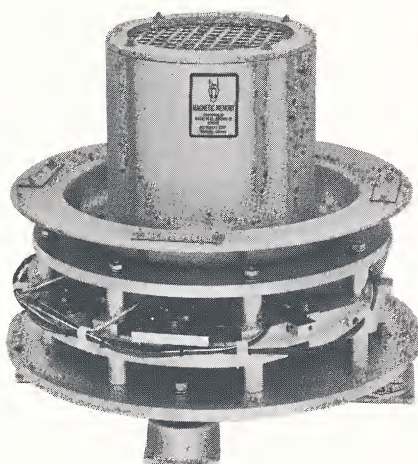
FEATURES:

- **DEPENDABILITY:** *Plated metal magnetic coating provides the optimum recording surface—hard and durable.*
- **CAPACITY:** *Bit packing densities to 1200 per inch NRZ (600 per inch phase modulation, R.B., or R.Z.).*
- **SIGNAL TO NOISE RATIO:** *26 db.*
- **VERSATILITY:** *Variable motor speeds available. Record head output and inductance adjustable to any electronic interface.*



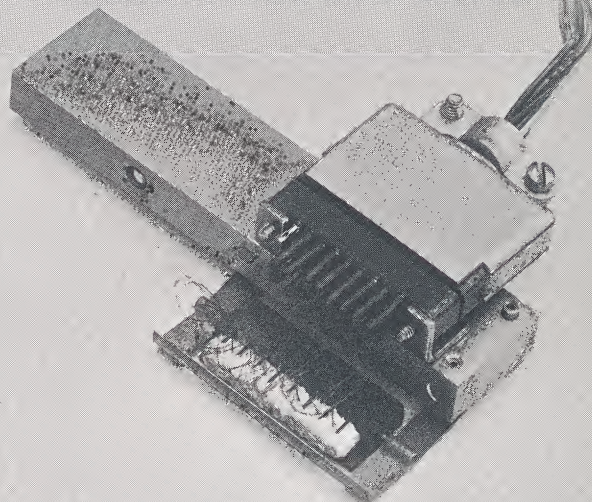
7" Diameter Disc 64 Tracks

SHOWN WITH COVER REMOVED



Storage capacity 600,000 bits.

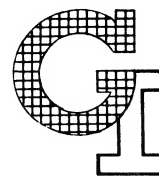
RECORD PLAY HEAD MODEL MHDM-158



8 Tracks Airfloating .015 inch Track width inductance variable

TYPICAL DISC

SPECIFICATIONS



MAGNE-HEAD

A Division of General Instrument Corporation

MODEL #71-64 DISC MEMORY

- 1.0 Maximum Capacity:** 524, 288 Bits
- 1.1 Number of Discs:** One (7" diameter)
- 1.2 Recording Diameters:** 6.5" Maximum
4.9" Minimum
- 1.3 Tracks/Radial Inch:** 40
- 1.4 Track Width:** .015"
- 1.5 Bits/Track:** 8129 maximum
- 1.6 Maximum Packing Density:** 532 Bits/Inch
- 1.7 Number of Tracks** 66 as follows:
- 1.7.1 2 Timing Tracks
 - 1.7.2 64 General Storage Tracks
 - 1.7.3 Registers, if required, will reduce the number of general storage tracks by approximately 8 tracks per register
- 1.8 Registers:**
- 1.8.1 Minimum Spacing at Maximum Density: 64 Bits
- 1.9 Magnetic Heads** (To be specified for a particular application)
- 1.9.1 Half Coil Inductance 150 Microhenries Maximum
30 Microhenries Minimum
 - 1.9.2 Unbalance between the two half coils of each head will be less than 5%
 - 1.9.3 Gap Width: .00025"
 - 1.9.4 Write Current required for full saturation: (Depends on head selected)
Probable Range: 60 to 150 Milli-amperes
 - 1.9.5 Playback Variation: 2 to 1
 - 1.9.6 Amplitude Modulation: 10% Maximum
as defined by the formula

$$\% \text{ Mod} = \frac{2 (\text{Max} - \text{Min})}{\text{Max} + \text{Min}} \times 100$$
- 1.10 Type of Recording:** Phase Modulation

- 1.11 Noise:**
- 1.11.1 Random noise from any D.C. erased track will be less than 10% of the minimum playback amplitude
- 1.12 Drive System:** Integral Induction Motor
(Synchronous on special application)
- 1.12.1 Speed: 900 RPM, 1800 RPM or 3600 RPM
 - 1.12.2 Power Supply Required: 60 cps 115 V Single Phase
60 cps 220 V Single Phase
60 cps 208 V Three Phase
 - 1.12.3 Starting Device: Single Phase Drives require start and run capacitors and time delay relay
- 1.13 Bearings:**
- 1.13.1 Super Precision Grade 7 Preloaded Ball Bearings are used with a design life of 5 years.
 - 1.13.2 Bearings are grease lubricated for the lifetime of the bearings
- 1.14 Physical Package:**
- 1.14.1 Axis of Rotation: Vertical
 - 1.14.2 Overall Size: 11" dia. x 11" high
 - 1.14.3 Total Weight: 45 lbs.
 - 1.14.4 Isolator Mounts: 3 Mounts providing 90% isolation at the rotational speed frequency
 - 1.14.5 Finish: — Structure: Golden Iridite
 - 1.14.6 Finish: — Dust Cover: Ivory Enamel
- 1.15 Environmental Limitations: — (Operating)**
- 1.15.1 Ambient Temperature: 50°F to 100°F
 - 1.15.2 Thermal Shock: No restriction within ambient range
 - 1.15.3 Humidity: 0 to 95%
 - 1.15.4 Dust Cover Removal: Restricted to a clean area
- 1.16 Environmental Limitations: (Non-Operating)**
- 1.16.1 Ambient Temperature: 0°F to 180°F
 - 1.16.2 Storage Time: One Year without relubrication of bearings

MODEL #91-64 DISC MEMORY

1.0 Maximum Capacity:	736,000
1.1 Number of Discs:	One (9" diameter)
1.2 Recording Diameters:	8.5" maximum 6.5" minimum
1.3 Tracks/Radial Inch:	32
1.4 Track Width:	.015"
1.5 Bits/Track:	11,500 maximum
1.6 Maximum Packing Density:	533 bits/inch
1.7 Number of tracks:	67 as follows:
1.7.1 64 data tracks	
1.7.2 1 clock track (8192 bits)	
1.7.3 1 synch track	
1.7.4 1 register track	
1.8 Registers:	
1.8.1 1 register track with spacing between read and write head to be approximately 800 bits.	
1.9 Magnetic heads	
1.9.1 Half Coil Inductance	50 microhenries ± 10%
1.9.2 Unbalance between the two half coils of each head will be less than 5%	
1.9.3 Gap Width:	.00025"
1.9.4 Write Current required for full saturation:	100 milliamperes maximum
1.9.5 Playback Amplitude:	50 millivolts minimum
1.9.6 Amplitude Modulation:	15% maximum
1.10 Type of Recording:	Phase Modulation
1.11 Noise:	
1.11.1 Random noise from any DC erased track will be less than 10% of minimum playback amplitude	

1.12 Drive System:	Integral Induction Motor
1.12.1 Speed:	3600 RPM (Less 5% slip)
1.12.2 Power:	115V, 60 CPS, single phase
1.12.3 Starting Device:	Single Phase Drives require start and run capacitors
1.13 Bearings:	
1.13.1 Super Precision Grade 7 preloaded ball bearings are used with a design life of 10 years.	
1.13.2 Bearings are grease lubricated for the lifetime of the bearings	
1.14 Physical Package:	
1.14.1 Axis of Rotation:	Vertical
1.14.2 Overall Size:	13" diameter x 11" high
1.14.3 Total Weight:	45 lbs.
1.14.4 Isolator Mounts:	4 Mounts providing 90% isolation at the rotational speed frequency
1.14.5 Finish: — (Structure)	Golden Iridite
1.14.6 Finish: (Dust Cover)	Ivory Enamel
1.15 Environmental Limitations: — (Operating)	
1.15.1 Ambient Temperature:	50°F to 100°F
1.15.2 Thermal Shock:	No restriction within ambient range
1.15.3 Humidity:	0 to 95%
1.15.4 Dust Cover Removal:	No restriction within ambient range
1.16 Environmental Limitations: (Non-Operating)	
1.16.1 Ambient Temperature:	0°F to 180°F
1.16.2 Storage Time:	One year without relubrication of bearings

MODEL #134-512 DISC MEMORY

1.0 Maximum Capacity:	8,192,000 Bits
1.1 Number of Discs:	Four (13" Diameter)
1.2 Recording Diameters:	12.5" Maximum 9.3" Minimum
1.3 Tracks/Radial Inch:	40
1.4 Track Width:	.015"
1.5 Bits/Track:	16,000 Maximum
1.6 Maximum Packing Density	548 Bits/Inch
1.7 Number of Tracks	516 as follows
1.7.1 4 Timing Tracks	
1.7.2 512 General Storage Tracks	
1.7.3 Registers, if required, will reduce the number of general storage tracks by approximately 4 tracks per register	
1.8 Registers:	
1.8.1 Minimum Spacing: at maximum density	64 Bits
1.9 Magnetic Heads	(To be specified for a particular application)
1.9.1 Half Coil Inductance:	100 Microhenries Maximum 15 Microhenries Minimum
1.9.2 Unbalance between the two half coils of each head will be less than 5%	
1.9.3 Gapwidth:	.00025"
1.9.4 Write current required for full saturation:	(Depends on head selected)
Probable Range:	60 to 150 Milli-amperes
1.9.5 Playback Variation:	3 to 1
1.9.6 Amplitude Modulation: as defined by the formula	15% Maximum
$\% \text{ Mod} = \frac{2 (\text{Max} - \text{Min})}{\text{Max} + \text{Min}} \times 100$	
1.10 Type of Recording:	Phase Modulation
1.11 Noise:	
1.11.1 Random noise from any DC erased track will be less than 10% of the minimum playback amplitude	

1.11.2 Crosstalk between any head which is reading a register track or a clock track and any other head which is writing will be less than 10% of the minimum playback amplitude.	
1.12 Drive System:	Integral Induction Motor (Synchronous on Special Application)
1.12.1 Speed:	900 RPM, 1800 RPM or 3600 RPM
1.12.2 Power Supply Required:	60 cps 115 V Single Phase 60 cps 220 V Single Phase 60 cps 208 V Three Phase
1.12.3 Starting Device:	Single Phase Drives require start & run capacitors and time delay relay
1.13 Bearings:	
1.13.1 Super Precision Grade 7 Preloaded Ball Bearings are used with a design life of 10 years.	
1.13.2 Bearings are grease lubricated for the lifetime of the bearings	
1.14 Physical Package:	
1.14.1 Axis of Rotation:	Vertical
1.14.2 Overall Size:	17" dia. x 17" high
1.14.3 Total Weight:	120 lbs.
1.14.4 Isolator Mounts:	4 Mounts providing 90% isolation at the rotational speed frequency
1.14.5 Finish: Structure:	Golden Iridite
1.14.6 Finish: Dust Cover:	Ivory Enamel
1.15 Environmental Limitations: — (Operating)	
1.15.1 Ambient Temperature:	50°F to 100°F
1.15.2 Thermal Shock:	No Restriction within ambient range.
1.15.3 Humidity:	0 to 95%
1.15.4 Dust Cover Removal:	Restricted to a clean area
1.16 Environmental Limitations: (Non-operating)	
1.16.1 Ambient Temperature:	0°F to 180°F
1.16.2 Storage Time:	One Year without relubrication of bearings

	MODEL	No. OF DISCS & DIA.	MAX NUMBER DATA TRACKS	BITS PER TRACK MAX	TOTAL BIT CAPACITY	OUTSIDE DIMENSIONS DIA X HIGH	BIT DENSITY INNER TRACK	PRICE SINGLE UNITS	PRICE 10 TO 30 UNITS	PRICE 50 & UP
SERIES 70	71-64	ONE 7"	64	8192	524,288	11" X 11"	532 Bits/Inch	\$ 3,000	\$ 2,800	\$2,500
	71-128	ONE 7"	128	5200	665,600	11" X 11"	500 Bits/Inch	\$ 4,000	\$ 3,600	\$3,250
	72-256	TWO 7"	256	5200	1,331,200	11" X 14"	500 Bits/Inch	\$ 6,000	\$ 5,200	\$4,750
SERIES 90	91-64	ONE 9"	64	11500	736,000	13" X 11"	533 Bits/Inch	\$ 4,000	\$ 3,800	\$3,500
	91-128	ONE 9"	128	8800	1,126,400	13" X 11"	533 Bits/Inch	\$ 5,000	\$ 4,600	\$4,250
	92-256	TWO 9"	256	8800	2,252,800	13" X 14"	533 Bits/Inch	\$ 7,000	\$ 6,200	\$5,750
SERIES 110	111-64	ONE 11"	64	14895	953,280	15" X 11"	533 Bits/Inch	\$ 5,000	\$ 4,800	\$4,500
	111-128	ONE 11"	128	12200	1,561,600	15" X 11"	533 Bits/Inch	\$ 6,000	\$ 5,600	\$5,250
	112-256	TWO 11"	256	12200	3,123,200	15" X 14"	533 Bits/Inch	\$ 8,000	\$ 7,200	\$6,750
SERIES 130	131-64	ONE 13"	64	18200	1,164,800	17" X 11"	533 Bits/Inch	\$ 6,000	\$ 5,800	\$5,000
	131-128	ONE 13"	128	16000	2,048,000	17" X 11"	548 Bits/Inch	\$ 7,000	\$ 6,600	\$5,750
	132-256	TWO 13"	256	16000	4,096,000	17" X 14"	548 Bits/Inch	\$ 9,000	\$ 8,200	\$7,250
	134-512	FOUR 13"	512	16000	8,192,000	17" X 17"	548 Bits/Inch	\$13,000	\$11,400	\$9,500

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MAGNE-HEAD



MAGNETIC DRUM MEMORY SYSTEMS

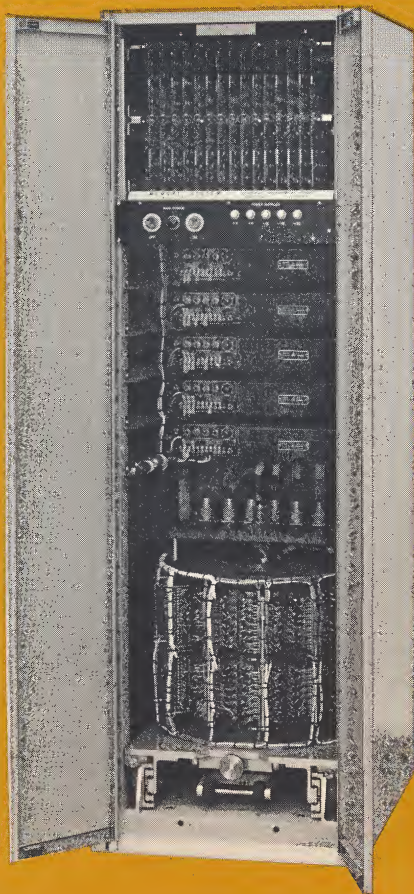
Magne-Head engineers and technicians form a team with the proven capability to design Magnetic Drum Memory Systems which meet the most exacting requirements.

Every Magne-Head project benefits from experience in engineering and producing sophisticated drum memory systems. Accomplishments include memories for military command and control networks, tactical displays, and computer-based communications multiplexing.

Teamwork does it. A single engineering group is responsible for the complete system. The three major system components—heads, drums, and circuits—are designed and manufactured at Magne-Head by specialists in each component area.

Component integration can be costly and time consuming if a memory system is purchased piecemeal. Matching heads to drums and both to circuitry are exacting specialties, *Magne-Head specialties*. Production hardware at Magne-Head is "state of the art" elsewhere. Put these accomplishments and the benefits of single-source responsibility for all components to work for you.

Check your requirements for your complete Magnetic Drum Memory System with Magne-Head.

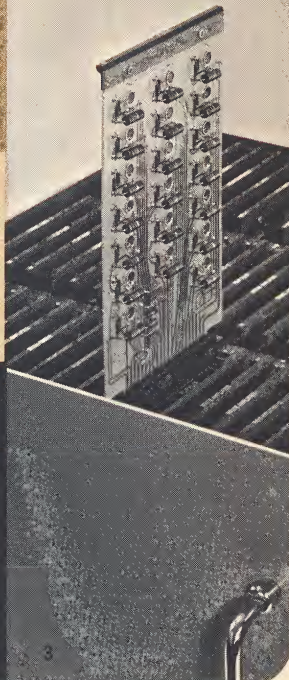


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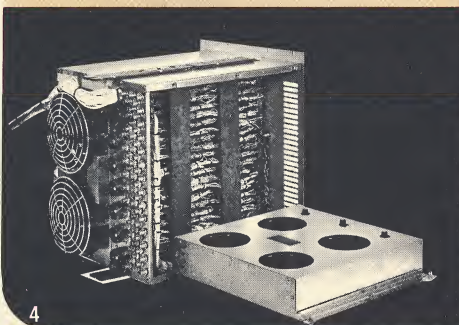
1. Typical memory system for computers, data processors, and communications switching systems.
2. Drum Tester.
3. Logic Boards.
4. Military Memory System



2



3



4

**GENERAL INSTRUMENT CORPORATION...
RESEARCH AND MANUFACTURING FACILITIES
LOCATED THROUGHOUT THE UNITED STATES**

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New York
Chicopee
Massachusetts
Darlington
South Carolina

Garden City
New York
Hawthorne
California
Hicksville
New York (2)
Joliet
Illinois

Mt. Forest
Ontario, Canada
Newark
New Jersey
Tazewell
Virginia
Waterloo
Ontario, Canada

Westbury
New York
Westwood
Massachusetts
Woodbury
Connecticut
Woonsocket
Rhode Island



**MAGNE-HEAD, A DIVISION OF
GENERAL INSTRUMENT CORPORATION**

MAGNETIC MEMORY DRUMS

All magnetic memory drums designed and manufactured by Magne-Head are made of special magnesium alloy, chosen for its strength, light weight and dimensional stability through temperature cycling and aging.

The rotating member is a properly proportioned cylinder with end plates mounted on tapered conical fits. The shaft and end plates are fitted together with slotted cones. There are no press or shrink fits in a Magne-Head drum.

The magnetic medium is hard nickel-cobalt plate which eliminates catastrophic failures due to foreign matter coming in contact with the rotating member, and the dusting and flaking problems inherent with iron oxide coatings.

The shroud assembly is an ultra precision machined portion of the drum with close tolerances which make possible a simple head placement and maintenance procedure.

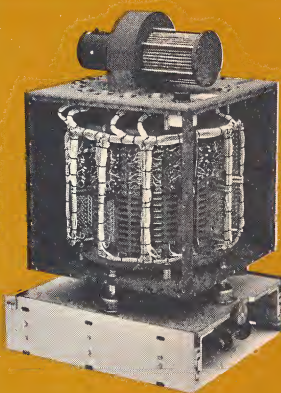
A motor is custom designed for each application and is shaped to fit inside the drum proper, resulting in very efficient use of space.

The Magne-Head drum uses a double squirrel cage rotor in every induction motor. A low reluctance portion of the rotor gives excellent start characteristics; a high reluctance portion contributes to low slip, high efficiency run characteristics.

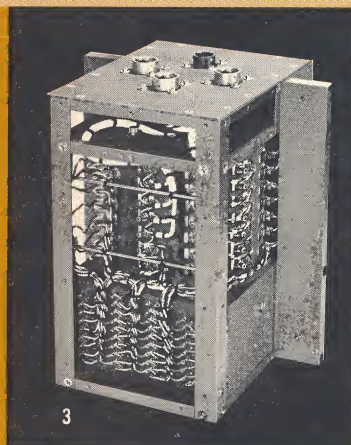
The light weight magnesium drum, coupled with air floating record-play-back heads and metal magnetic coatings make up the most efficient drum package available. This package is almost impervious to temperature shocks, environmental extremes, aging, technician's error, shipping hazards, and the myriad of other problems, inherent with less advanced designs.



1



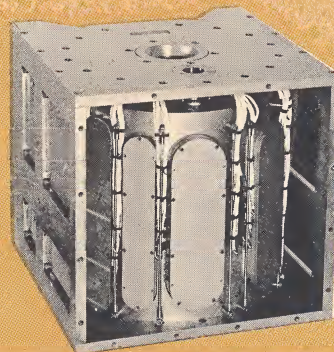
2



3

1. D5000 Drums coupled for 40,000,000 bit capacity as compared to D50 with 200,000 bit capacity.
2. D500 Magnetic Memory Drum.

3. Militarized D50 Magnetic Memory Drum.
4. D500 Hermetically Sealed Militarized Magnetic Memory Drum.



4

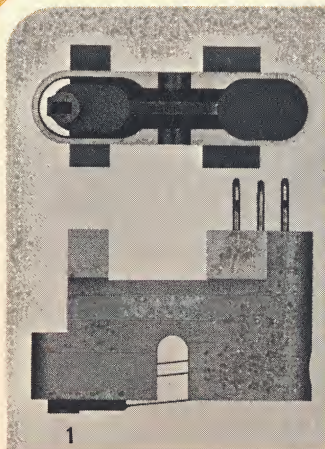
AIR FLOATING DRUM HEADS

Magne-Head manufactures a complete line of air floating record-playback heads. Conservative design, tight manufacturing tolerances, and close surveillance of manufacturing eliminate complicated installation and adjustment procedures. The addition or replacement of heads without stopping the drum cuts installation and adjustment time to a fraction of that required for conventional, non-floating heads. The proximity of the air floating head to the magnetic medium greatly improves record-read efficiency. Record currents are reduced typically by a factor of two. Playback signal is at least tripled over non-floating heads of equivalent inductance and track width. The resulting lower inductance, required for a given application, allows more rapid data transfer into and out of the drum.

MAGNETIC HEADS

Magne-Head is an industry leader in the design and manufacture of magnetic heads for all areas of commercial and military application. Continuing research enables Magne-Head to offer improvements in both performance standards and packaging design. Heads for special purposes, such as magnetic ink character recognition, ledger stripe reading and multiple track magnetic card reading are used in production by many leading equipment manufacturers. Industry standard tape heads are available in the IBM and IRIG track formats for read after write and interlace recording.

Look to Magne-Head. Our engineering people are available to work with you on any magnetic head problem—large or small—from prototype to production.



1

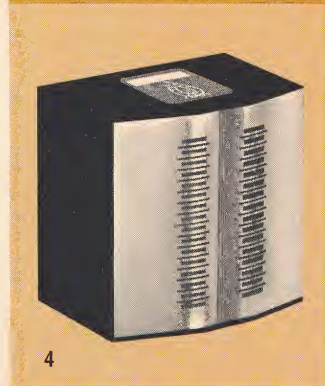


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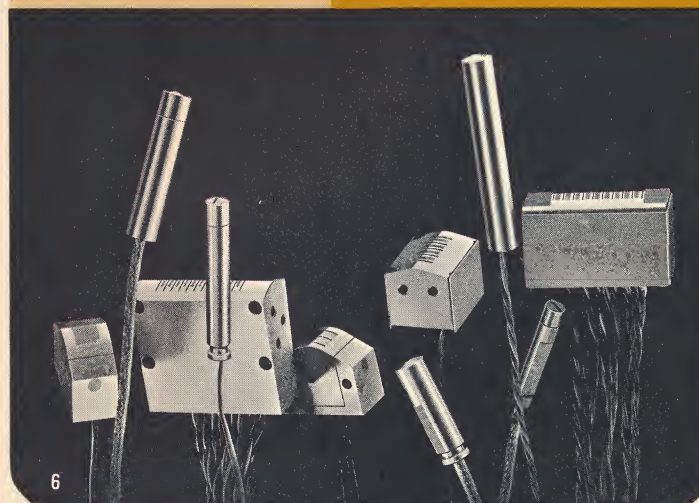
1. MHD-1 Single track airfloating digital drum head.
2. DHW-56 56-track read after write digital head—3" tape.
3. TB-10 10-track read/write analog head— $\frac{1}{2}$ " tape.
4. DEW-16 16-track read after write digital head—1" tape.
5. DBW-7 7-track read after write digital head— $\frac{1}{2}$ " tape.
6. Head group illustrating form factor flexibility.



4



5



6

MAGNE-HEAD, A DIVISION OF GENERAL INSTRUMENT CORPORATION

Magne-Head is a division of General Instrument Corporation, one of America's largest and most successful electronic companies. As do all divisions of General Instrument, Magne-Head operates autonomously, with the stability and maturity of management characteristic of large corporations. Each division is free to draw on each of the others for their particular specialties. This gives each division a broad platform of capability. The financial strength of General Instrument assures that Magne-Head will be here to finish long term projects.

Activities at Magne-Head cover the whole range of manufacturing from prototype to production. Magne-Head designs and manufactures tape heads, magnetic memory drums and magnetic memory drum systems for aerospace, military and industrial applications. Many of the nation's critical and high priority military and space programs rely on Magne-Head products for both in-flight and ground support applications.

Quality Control at Magne-Head is an independent group reporting directly to Division management.

Military and commercial customer survey teams have approved Magne-Head production and inspection facilities. Plant, people, and procedures meet the exacting standards of major prime military contractors including the Martin Company, General Electric Company, Bunker-Ramo Corp., Nortronics Division of Northrop Corporation, the Lockheed Missiles and Space Company, and International Telephone and Telegraph Corp. Magne-Head is serviced by quality control representatives of both the United States Air Force and Army Ordnance.

Factory Sales and Application Engineering staffs are available for on-the-spot consultations in the customer's plant. A strong network of representatives is maintained throughout the United States to provide fast, convenient customer service.

Design and production facilities are located in Hawthorne, California, the heart of the aerospace complex near Los Angeles International Airport, and provide convenient customer liaison and the fastest possible delivery of hardware to both the domestic and foreign markets.



MAGNE-HEAD *a division of General Instrument Corp.*

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